CS 162 Section 9

Short Answer

- 1. What does ACID stand for? Explain each of them.
- 2. What are types of possible conflicts in an execution of multiple transactions? Express your answer in terms of Read and Writes.
- 3. Two schedules are conflict equivalent if and only if:
- b. (7 points total) Consider the following schedule of four transactions:

```
T1: R(B) R(A) W(A) W(B)
T2: W(B)
T3: W(A) W(A)
T4: W(C)
```

i) (4 points) Draw the dependency graph for this schedule.

(3 points) Is this schedule serializable? If so, give a possible serial schedule.
 Otherwise, explain why not.

Long Answer: 2PL

- 1. Quick Facts
 - a. State the difference between 2PL and Strict 2PL.
 - b. What condition does Strict 2PL avoid that 2PL does not?
- 2. Consider the two transactions below. Assume each instruction takes one time unit, and acquiring/releasing a lock takes **zero time units**. Once a transaction acquires a shared lock it cannot upgrade it to an exclusive lock, and once a transaction acquires an exclusive lock it cannot downgrade to a shared lock.

Transaction 1 R(A); A = A + 100; W(A); R(B); B = B - 100; W(B); Transaction 2 R(A); A = A - 50; W(A); W(A);

What is the minimum possible execution time taken by both transactions when using 2PL? Show a schedule that achieves the minimum time. The diagram below shows the first several instructions – note that Transaction 2 is only **requesting** the lock, it has to wait for it to be released

<pre>Transaction 1: Lock_X(A) <granted></granted></pre>	Transaction 2:
R(A);	Lock_X(A) <requested></requested>